RELEASE OF PARASITIC WASPS TO CONTROL STABLE FLIES IN KANSAS DAIRIES

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Summary

After release of fly parasites in Kansas dairies during 1991, parasitism increased from May to late June then dropped in July. The parasite released was *Spalangea nigroaenea* of Kansas origin to assure its adaption to Kansas conditions. Additional studies of fly parasite releases are needed to develop a reliable fly reduction program for Kansas dairies before fly parasite purchases can be reliably recommended. Release of adapted parasite species and removal of fly breeding areas will be essential for reduction of fly numbers at Kansas dairies.

Introduction

Several dairy operations inquired about using fly parasites to control flies during 1991. Those requests prompted experimental releases of a Kansas strain of *Spalangia nigroaenea* that had shown promise for reduction of stable flies in cattle feedlots. The similarity of dairies and feedlots suggested that stable fly control would be similar in both livestock confinements. Parasites were purchased and released at several dairies and fly pupal samples were taken to record if parasitism by the released parasite increased. In addition to parasite releases, suggestions were made to help reduce the fly breeding areas. Those suggested changes contributed to the reduced fly numbers in most dairies.

Procedures

Cooperating dairies were surveyed prior to parasite releases to estimate the number of parasites needed. The fly breeding area at each dairy was estimated, and the number of parasites released was 20,000 or 40,000 per week depending on the number of cattle present and potential fly breeding area. The KK dairy received a variable number of parasites (40,000 to 250,000/week) based on the stable fly catches and size of the fly breeding area.

Fly pupae were collected at each dairy, with an attempt to collect 100 or more on each date. Those fly pupae were held individually, and fly or parasite emergence was recorded. One sample (May 25) was missed at the non-release dairy, DK.

Results and Discussion

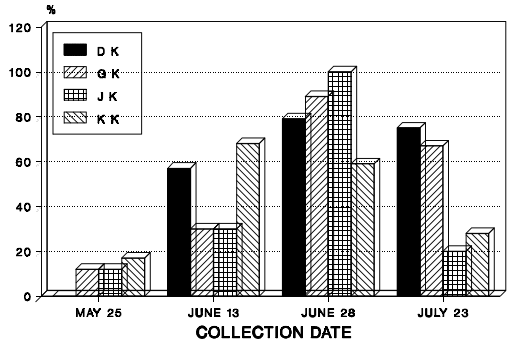

Figure 1. Parasite Emergence from Fly Pupae Collected from Four Dairies with the Reciprocal Percentage Being Flies.

The live fly pupae collected at the GK and JK dairies were increasingly parasitized through June 28, then parasitism decreased on July 23 (Figure 1). That suggests that fly parasite releases increased parasitism. A similar trend was seen at the non-release dairy, DK, where parasitism was 57 to 79 percent. That was higher than observed in cattle feedlots and was high relative to the

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extremely high fly populations present. The decline in parasitism on July 23 may relate to the decrease in fly populations and the change from stable fly to house fly. In comparison to the parasite release dairies, there was considerable parasitism in the non-release dairy, even though flies were more numerous there.

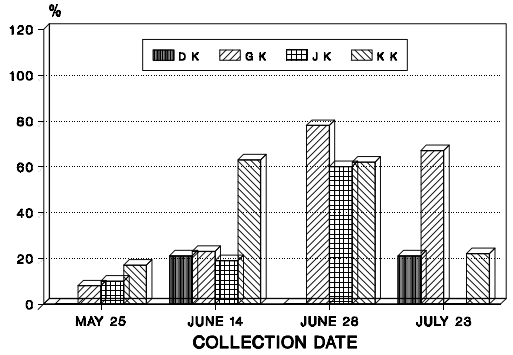

Figure 2. Percentage of Fly Pupae Collected from Dairies that Produced *S. nigroaenea* Parasites.

The percentage of live fly pupae producing *S. nigroaenea* parasites increased with time at the GK and JK dairies (Figure 2). That increase was not as apparent at KK dairy, where the percentage decreased by July 23. The DK dairy, where no parasites were released, had very few *S. nigroaenea*. However, they did occur there on June 14 and July 23, suggesting that the parasite species occurs naturally in central Kansas dairies. The low parasitism on May 25 prior to the effects of released parasites and the three times greater parasitism in the KK dairy on June 14 where releases began earlier show the effects of *S. nigroaenea* releases. The reduced percentage of *S. nigroaenea* on July 23 resulted from an increase of *Muscidifurax* from house fly pupae.

Comparing the composition of the fly parasites by species (Figure 3), *S. nigroaenea* contributed over 60 percent of the emerged parasites in 11 of 15 samples. That is a high percentage, considering the number of house fly pupae collected. House flies are much more attractive to *Muscidifurax* than to *Spalangia*. Several of the house fly samples were predominately parasitized by *Muscidifurax* and produced some of the 0 percent *S. nigroaenea* bars in Figure 3. With the predominance of house flies after June 14, a lower percentage of *S. nigroaenea* would be expected, because non-release feedlots yield 38 percent *S. nigroaenea*. The 100 percent bar for DK on June 14 was only two specimens.

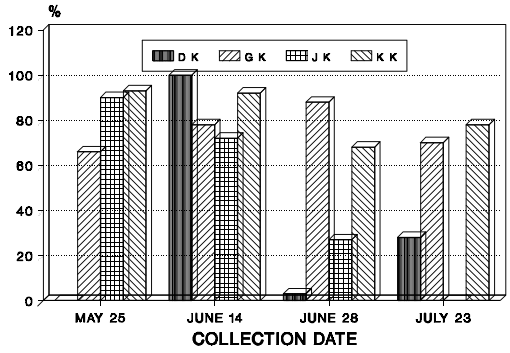

Figure 3. Percentage of Parasites Emerging from Fly Pupae Collected from Dairies that Were *S. nigroaenea*.

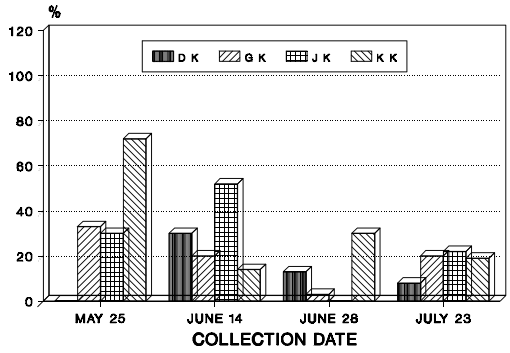

Figure 4. Percentage of Emerging House Fly and Stable Fly Adults from Fly Pupae Collected from Dairies.

The fly emergence from the collected pupae was very low (Figure 4). Even the non-release dairy had low fly emergence compared to the large number of flies present. Most collections were below 20%, with only 7 of 15 above 20% and 2 above 40% fly emergence. The dry and hot conditions in the dairy locations may have reduced fly survival.